1   <u>**CLAIMS**</u>

2   What is claimed is:

1   1.   A gateway for exchanging IP frames with remote IP devices over a

2   communication link to a frame switched network, the gateway comprising:

3   a wide area network interface coupled to the communication link for exchanging

4   the IP frames with the remote IP devices;

5   a local area network interface for receiving outbound IP frames from each of a

6   plurality of IP clients, each outbound IP frame comprising a local IP header and

7   payload:

8   the IP header comprising:

9   an IP client socket comprising a client IP address and a client port

10   number of the IP client; and

11   a destination socket comprising a remote device IP address and a

12   port number of a remote IP device; and

13   a router module coupled between the local area network interface and the wide

14   area network interface, the router module receiving each outbound IP frame from the

15   local area network interface and providing a corresponding translated outbound IP

16   frame to the wide area network interface;

17   the translated outbound IP frame comprising a translated IP client socket

18   comprising a gateway IP address and a global port number of the gateway that uniquely

19   associates with the IP client socket and:

20   the payload if the outbound IP frame is a data frame; and

21   translated payload if the outbound IP frame is a media session signaling

22   frame.

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1   2.   The gateway of claim 1, wherein:

2   a media session signaling fame comprises at least one of:

3   a media session socket comprising the client IP address and a media port

4   number of the IP client; and

5   a signaling contact socket comprising the client IP address and a signaling

6   port number and

7   the translated payload comprises:

8   a translated media session socket if the media session signaling frame

9   includes a media session socket, the translated media session socket comprising the

10 gateway IP address and a translated media port number that uniquely associated with

11 the media session socket; and

12   a translated signaling contact socket if the media session signaling frame

13 includes a signaling contact socket, the translated signaling contact socket comprising

14 the gateway IP address and a translated signaling port number that uniquely associated

15 with the signaling contact socket.

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1   3.   The gateway of claim 2, wherein the router module further comprises a

2   translation table for recording:

3   the global port number in unique association with the IP client socket;

4   the translated media port number in unique association with the media session

5   socket; and

6   the translated signaling port number in unique association with the signaling

7   contact socket.

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1   4.   The gateway of claim 1, wherein:

2   the router module comprises a frame handling module for comparing the

3   payload of the outbound IP frame to a plurality of signaling frame pattern and

4   determining that the outbound IP frame is a media session signaling frame if the

5   payload matches a signaling frame pattern.

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1   5.   The gateway of claim 1, further comprising:

2   a payload translation database for storing each signaling frame pattern in

3   association with translation instructions; and

4   a payload translation module for translating each socket of the payload that is

5   identified for translation in the translation instructions.

1   6.   A gateway for exchanging IP frames with remote IP devices over a

2   communication link to a frame switched network, the gateway comprising:

3   a wide area network interface coupled to the communication link for exchanging

4   the IP frames with the remote IP devices;

5   a local area network interface for receiving outbound IP frames from each of a

6   plurality of IP clients, each outbound IP frame comprising a local IP header and payload

7   :

8   the IP header comprising:

9   an IP client socket comprising a client IP address and a client port

10   number of the IP client; and

11   a destination socket comprising a remote device IP address and a

12   port number of a remote IP device; and

13   the payload comprising:

14   a media session socket comprising the client IP address and a

15   media port number of the IP client;

16   a router module coupled between the local area network interface and the wide

17   area network interface, the router module receiving each outbound IP frame from the

18   local area network interface and providing a corresponding translated outbound IP

19   frame to the wide area network interface, the translated outbound IP frame comprising

20   both a global IP header and translated payload:

21   the global IP global header comprising a translated IP client socket

22   comprising a gateway IP address and a global port number of the gateway that uniquely

23   associates with the IP client socket;

24   the translated payload comprising a translated media session socket

25   comprising the gateway IP address and a translated media port number that uniquely

26   associates with the media session socket; and

27   the router module comprising a translation table for recording both:

28   the IP client socket in association with the global port number; and

29   the media session socket in association with the global media port

30   number.

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1   7.   A gateway for exchanging IP frames with remote IP devices over a

2   communication link to a frame switched network, the gateway comprising:

3   a wide area network interface coupled to the communication link for exchanging

4   the IP frames with the remote IP devices;

5   a local area network interface for receiving outbound IP frames from each of a

6   plurality of IP clients, each outbound IP frame comprising an IP header and payload, the

7   local IP header comprising:

8   an IP client socket comprising a client IP address and a client port number

9   of the IP client; and

10   a destination socket comprising a remote device IP address and a port

11   number of a remote IP device;

12   a router module coupled between the local area network interface and the wide

13   area network interface, the router module receiving each outbound IP frame from the

14   local area network interface and providing a corresponding translated outbound IP

15   frame to the wide area network interface, the router module comprising:

16   an IP layer translation module for:

17   generating the translated outbound IP frame in response to

18   receiving an outbound IP frame, the translated outbound IP frame comprising a global

19   IP header and payload, the global IP global header comprising:

20   a translated IP client socket comprising a gateway IP

21   address and a global port number of the gateway that uniquely associates with the IP

22   client socket; and

23   the destination socket; and

24   recording the IP client socket in association with the global port

25   number in a translation table;

26   an application layer translation module for:

27   generating translated payload in response to detecting that the

28   outbound IP frame comprises at least one of a media session socket and a signaling

29   contact socket, the translated payload comprising:

30   a translated media session socket if the media session signaling frame

31   includes a media session socket, the translated media session socket comprising the

32   gateway IP address and a translated media port number that uniquely associated with

33   the media session socket; and

34   a translated signaling contact socket if the media session signaling frame

35   includes a signaling contact socket, the translated signaling contact socket comprising

36   the gateway IP address and a translated signaling port number that uniquely associated

37   with the signaling contact socket.

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1   8.   The gateway of claim 7, wherein the routing module further comprises a frame

2   handling module for passing the outbound IP frame with the payload to the IP layer

3   translation module in response to determining that the outbound IP frame is a data

4   frame.

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1   9.   The gateway of claim 8, wherein the frame handling module compares the

2   payload of the outbound IP frame to a plurality of signaling frame pattern to determine

3   that the outbound IP frame is a media session signaling frame if the payload matches a

4   signaling frame pattern.

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1   10.   The gateway of claim 7, wherein the routing module further comprises a

2   translation table and the application layer translation module further provides for

3   recording, in the translation table each of:

4   the global port number in unique association with the IP client socket;

5   the translated media port number in unique association with the media session

6   socket; and

7   the translated signaling port number in unique association with the signaling

8   contact socket.

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1   11.   A method of operating a gateway that supports multiple IP clients to effect the

2   exchange of IP frames between a plurality of IP clients and remote IP devices over a

3   communication link to a frame switched network, the method comprising:

4   receiving an outbound IP frame from each of a plurality of IP clients, each

5   outbound IP frame comprising a local IP header and payload:

6   the local IP header comprising:

7   an IP client socket comprising a client IP address and a client port

8   number of the IP client; and

9   a destination socket comprising a remote device IP address and a

10   port number of a remote IP device; and

11   providing a corresponding translated outbound IP frame to the wide area network

12   interface, the translated outbound IP frame comprising a translated IP client socket

13   comprising a gateway IP address and a global port number of the gateway that uniquely

14   associates with the IP client socket and:

15   the payload if the outbound IP frame is a data frame; and

16   translated payload if the outbound IP frame is a media session signaling

17   frame.

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1   12.   The method of claim 11, wherein:

2   a media session signaling fame comprises at least one of:

3   a media session socket comprising the client IP address and a media port

4   number of the IP client; and

5   a signaling contact socket comprising the client IP address and a signaling

6   port number and

7   the translated payload comprises:

8   a translated media session socket if the media session signaling frame

9   includes a media session socket, the translated media session socket comprising the

10   gateway IP address and a translated media port number that uniquely associated with

11   the media session socket; and

12   a translated signaling contact socket if the media session signaling frame

13   includes a signaling contact socket, the translated signaling contact socket comprising

14 the gateway IP address and a translated signaling port number that uniquely associated

15 with the signaling contact socket.

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1 13. The method of claim 12, further comprising recording, in a translation table:

2   the global port number in unique association with the IP client socket;

3   the translated media port number in unique association with the media session

4 socket; and

5   the translated signaling port number in unique association with the signaling

6 contact socket.

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1 14. The method of claim 11, further comprising:

2   comparing the payload of the outbound IP frame to a plurality of signaling frame

3 patterns; and

4   determining that the outbound IP frame is a media session signaling frame if the

5 payload matches a signaling frame pattern.

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1 15. The method of claim 11, further comprising:

2   translating each socket of the payload by identifying translation instructions

3 associated with each signaling frame pattern in a payload translation database.

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1 16. A method of operating a gateway that supports multiple IP clients to effect the

2 exchange of IP frames between a plurality of IP clients and remote IP devices over a

3 communication link to a frame switched network, the method comprising:

4   receiving each outbound IP frames from each of a plurality of IP clients, each

5 outbound IP frame comprising a local IP header and payload:

6   the IP header comprising:

7   an IP client socket comprising a client IP address and a client port

8 number of the IP client; and

9   a destination socket comprising a remote device IP address and a

10 port number of a remote IP device; and

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11   the payload comprising:

12   a media session socket comprising the client IP address and a

13   media port number of the IP client;

14   providing a corresponding translated outbound IP frame to the wide area network

15   interface, the translated outbound IP frame comprising both a global IP header (152)

16   and translated payload:

17   the global IP global header comprising a translated IP client socket

18   comprising a gateway IP address and a global port number of the gateway that uniquely

19   associates with the IP client socket;

20   the translated payload comprising a translated media session socket

21   comprising the gateway IP address and a translated media port number that uniquely

22   associates with the media session socket; and

23   recording, in a translation table, both:

24   the IP client socket in association with the global port number; and

25   the media session socket in association with the global media port

26   number.

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1   17.   A method of operating a gateway that supports multiple IP clients to effect the

2   exchange of IP frames between a plurality of IP clients and remote IP devices over a

3   communication link to a frame switched network, the method comprising:

4   receiving each outbound IP frames from each of a plurality of IP clients, each

5   outbound IP frame comprising an IP header and payload, the local IP header

6   comprising:

7   an IP client socket comprising a client IP address and a client port number

8   of the IP client; and

9   a destination socket comprising a remote device IP address and a port

10   number of a remote IP device;

11   providing a corresponding translated outbound IP frame to the wide area network

12   interface by a process of:

13   generating the translated outbound IP frame in response to receiving an

14   outbound IP frame, the translated outbound IP frame comprising a global IP header and

15   payload, the global IP global header comprising:

16   a translated IP client socket comprising a gateway IP address and

17   a global port number of the gateway that uniquely associates with the IP client socket;

18   and the destination socket; and

19   generating translated payload in response to detecting that the outbound

20   IP frame comprises at least one of a media session socket and a signaling contact

21   socket, the translated payload comprising:

22   a translated media session socket if the media session signaling frame

23   includes a media session socket, the translated media session socket comprising the

24   gateway IP address (156) and a translated media port number (164) that uniquely

25   associated with the media session socket (127); and

26   a translated signaling contact socket (155) if the media session signaling

27   frame includes a signaling contact socket (124), the translated signaling contact socket

28   (155) comprising the gateway IP address (156) and a translated signaling port number

29   (166) that uniquely associated with the signaling contact socket (154).

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1   18.   The method of claim 17, further comprising generating the translated IP frame

2   with the payload in response to determining that the outbound IP frame is a data frame.

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1   19.   The method of claim 18, wherein the step of determining whether the outbound

2   IP frame is a media session signaling frame comprises comparing the payload of the

3   outbound IP frame to a plurality of signaling frame pattern and determining that the

4   outbound IP frame is a media session signaling frame if the payload matches a

5   signaling frame pattern.

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1   20.   The method of claim 17, further comprising recording, in a translation table each

2   of:

3   the global port number in unique association with the IP client socket;

4   the translated media port number in unique association with the media session

5   socket; and

6   the translated signaling port number in unique association with the signaling

7   contact socket.

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